

BATTERY, ELECTROLYTIC CELL, AND FUEL CELL

ABSTRACT

A battery is provided containing increased binding energy
5 hydrogen compounds as oxidants of the battery cathode half reaction. The oxidant compounds are provided comprising at least one neutral, positive, or negative hydrogen species having a binding energy greater than its corresponding ordinary hydrogen species, or greater than any hydrogen species for which the corresponding ordinary hydrogen
10 species is unstable or is not observed. The oxidant compounds comprise at least one increased binding energy hydrogen species and at least one other atom, molecule, or ion other than an increased binding energy hydrogen species. The oxidant compound may comprise a cation M^{n+} (where n is an integer) bound to an increased binding energy hydride ion such that the binding energy of the cation or atom $M^{(n-1)+}$ is less than the binding energy of the hydride ion $H^-\left(\frac{1}{p}\right)$ may serve as the oxidant.
15 Alternatively, an increased binding energy hydride ion may be selected for a given cation such that the hydride ion is not oxidized by the cation. Thus, the oxidant $M^{n+} H^-\left(\frac{1}{p}\right)_n$ comprises a cation M^{n+} , where n is an
20 integer and the increased binding energy hydride ion $H^-\left(\frac{1}{p}\right)$, where p is an integer greater than 1, that is selected such that its binding energy is greater than that of $M^{(n-1)+}$. The increased binding energy hydrogen ion has a further application as the negative ion of the electrolyte of a high voltage electrolytic cell.